NON-PUBLIC?: N
ACCESSION #: 9510020073
LICENSEE EVENT REPORT (LER)

FACILITY NAME: LaSalle County Station Unit 1 PAGE: 1 OF 6

DOCKET NUMBER: 05000373

TITLE: Unit 1 Reactor Scram Due to 1D RPS Trip Causing Group 1 Isolation
EVENT DATE: 08/16/95 LER #: 95-014-00 REPORT DATE: 09/15/95

OTHER FACILITIES INVOLVED: None DOCKET NO: 05000

OPERATING MODE: N POWER LEVEL: 000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Thomas Hammerich, Senior System Engineer, Ext. 2244 TELEPHONE: (815) 357-6761

COMPONENT FAILURE DESCRIPTION:
CAUSE: B SYSTEM: RP COMPONENT: 1C71- MANUFACTURER: GE 5003D
REPORTABLE NPRDS: Yes

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On 8/16/95 at 2006 hours, LaSalle Unit 1 was operating at approximately 100% Power when the 1D Reactor Protection System (RPS)JE! Electrical Power monitoring Assembly (EPMA) tripped resulting in the 1B RPS Run Trip. Loss of power to this bus resulted in numerous Primary Containment Isolations (PCIS) NH!, including isolation of the Reactor Building Ventilation System (VR) dampers on both units. Abnormal operating procedure LOA-VR-01, "Recovery from a Group 4 Isolation or Spurious Trip of Reactor Building Vent", was entered to jumper isolation circuits such that the ventilation loss would not result in MSIV closure on high steam tunnel temperature. At 2013 hours, a Group I isolation occurred on Unit I due to high steam tunnel temperature, despite the installation of the bypass Jumpers. An automatic reactor scram occurred as a result of closure of the MSIVs. Following the scram, reactor level and pressure

were controlled with the Reactor Core isolation cooling (RCIC) BN! System and Safety Relief Valves (SRVs). Ventilation was restored on Unit 2 without incident.

An investigation was performed and the cause of the scram was a Group 1 isolation caused by MSIV closure due to Main Steam Line Tunnel high temperature

This is reportable per 10CFR50.73(a)(2)(iv) due to an automatic actuation of an engineered safety feature (ESF).

END OF ABSTRACT

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor

Energy Industry Identification system (EIIS) codes are identified in the text as XX!.

A. CONDITION PRIOR TO EVENT

Unit(s): 1/2 Event Date: 8/16/95 Event Time: 2006 Hours

Reactor Mode(s): 1/1 Modes(s) Name: Run/Run Power Level(s):100%/100%

B. DESCRIPTION OF EVENT

On August 16, 1995 Units 1 and 2 were in Operational Condition 1 (run) at 100% power. At 2006 hours, the 1D RPS Electrical Power Monitoring Assembly (EPMA)JE!, 1C71-S003D, tripped resulting in a half scram and numerous Primary Containment Isolation System (PCIS) Isolations. Both Units' Reactor Building Ventilation (VR) secondary containment isolation dampers isolated due to the PCIS actuation. The "B" RPS bus was transferred to alternate feed in accordance with LOA-RP-01, and the half scram was reset. Due to the loss of VR, the Main Steam Tunnel Temperature increased causing Division 2 Main Steam Line Tunnel Hi Temperature trip which resulted in a half MSIV Isolation Signal. The PCIS was manually reset, and the Main Steam Line Drains were opened. PCIS Channel B1 reset, but, as subsequently determined, Channel B2 did not reset.

At 2008 hours, procedure LOA-VR-01 was entered on both units to install jumpers in the steam tunnel high temperature and

differential temperature isolation circuits to prevent a Group 1 MSIV isolation due to loss of VR. PCIS was manually reset again. VR was restarted on Unit 2 at 2010 hours.

At 2013 hours, while in the process of restarting VR on Unit 1, a Group 1 isolation occurred on Unit 1 due to high steam tunnel temperature. Following the closure of the MSIVs, a full reactor SCRAM occurred, and all control rods fully inserted. LGA-01, "RPV Control", was entered due to high reactor pressure and low reactor water level. LGA-02, "Secondary Containment Control" was entered due to high area temperature in the Main Steam Line Tunnel (loss of VR).

B. DESCRIPTION OF EVENT (Continued)

LGA-03, "Primary Containment control", was entered due to high suppression pool temperatures that resulted from four safety relief valves opening as expected when the MSIVs closed. The lowest reactor water level determined at this time was a -30 inch spike when the MSIVs closed. This is a higher level than the initiation setpoints of all of the Emergency Core Cooling Systems. A SRM failed downscale after the scram. After the SCRAM with the unit in hot shutdown (Operational Condition 3), insufficient IRMs for A RPS were operable, and the A RPS scram channel was placed in the tripped condition in accordance with Technical specifications. Following a SRV actuation and subsequent closure at 2103 hours, another reactor scram on low reactor level occurred due to vessel level shrink. The SRVs controlled reactor pressure in the Low-Low Set mode of operation immediately after the scram. Additionally, Division I ARI and Division I ATWS initiated. During this event, RV level was maintained in the Low Low Set Mode between 995 psig and 845 psig.

The Reactor Recirc Pumps tripped off due to an ATWS signal from a low level signal spike. Ringing caused indicated level oscillations of -129 inches to -50 inches for durations of 40 to 140 milliseconds. The ATWS trip setpoint for the Reactor Recirc Pumps is -50 inches. Based on ATWS instrument response times, the ATWS Reactor Recirc Pump trip was expected. The level signal spikes were of sufficiently short duration to preclude HPCS and RCIC initiation.

C. CAUSE OF EVENT

The root cause of the EPMA failure was a spurious undervoltage trip initiated from the EPMA logic card. A loose terminal connection on

the card was found during initial inspections. After initial troubleshooting was completed, the following problems were noted during the testing: the EPA logic card's undervoltage and overvoltage setpoints were found out of tolerance. This board was subsequently replaced. Various solder connections on the EPA logic cards were "COLD". Various wires connected to the logic card were brittle and were able to be disconnected by simply applying light force to the wire. This problem was noted on the wire feeding the trip coil in the circuit breaker. (Loss of power to the trip coil will cause the circuit breaker to trip open.)

Off site testing determined that the solder joints were poor and may have been a contributing factor to this problem. Electrical testing revealed that the voltage functions on this logic card failed.

C. CAUSE OF EVENT (Continued)

The specific root cause was indeterminate but the most likely cause of the failure is limited to the logic card. All other circuits affecting the RPS MG set breaker were tested and no problems were identified.

The root cause of the failure of the "B" PCIS channel "B2" not resetting has not been determined. All affected parts of the "B2" channel logic circuit were thoroughly tested, and no problems were identified.

During the Unit 1 event, the PCIS Channel B2 logic did not reset after the MSL Temperature junipers were installed and the PCIS Reset Pushbuttons were again depressed for reset as reported by the Operator. Testing has been performed per LST 95-062, "Unit 1 PCIS Group 1 Channel B2 As Found Logic Test", on the PCIS B2 Channel circuitry to determine the cause of the failure to reset. The as found circuitry has been tested for proper circuit voltages and contact resistances to determine if any relays are suspect in not providing circuit continuity.

The testing indicated that the isolation relay continuity was normal and that proper reset of the circuit with the RESET pushbutton was functional. Further testing was completed per LST 95-063, "Unit 1 PCIS Channel Isolation Logic Test", to verify the repeatability of the reset circuit by verifying the circuit satisfactorily reset ten (10) times, and to verify the proper pickup and functioning of the 1B21H-K3D relay which actuated on the MSL high temperature. The

test results indicated that the relay logic functions properly, and that there is reliability in the RESET circuit.

Proper functioning of the B2 Channel was verified during the swap of RPS Bus B to the normal B RPS Motor-Generator. At this time the RPS Bus B was de-energized for the dead bus transfer under similar circumstances to that during the event. The proper reset was verified at that time.

Testing was also performed to determine the source of unusual Relay Panel noise which was heard during the event. A reactor scram was initiated manually (with the reactor shutdown), while observing the panel 1H13-P611 for unusual noise. The loud noise was not observed during the testing, and no conclusions could be drawn as to the source of the noise.

C. CAUSE OF EVENT (Continued)

The PCIS Group 1 Channel B2 logic was found to function properly after the event. No abnormal conditions were noted in regard to the relay contact resistances or voltage drops. There was good repeatability in the functioning of the RESET circuit. Physical inspection of the relays and wiring do not indicate a degraded condition.

The cause of the Channel B2 circuit not resetting was not determined. While it is possible that there was a physical problem in the reset and logic circuitry, it could not be identified. However, the safety function of the PCIS Group 1 Channel B2 circuit to provide its trip function during an accident condition is not affected by the failure of the channel to reset. No physical binding of components was observed which would prevent the de-energizing of the 1B21H-K7D relay trip function from occurring. The MSIV isolation safety function was not challenged.

Testing has not indicated the need for changeout of any relay components. Routine quarterly and monthly functional testing of the Group 1 isolation channels will provide the assurance of continued operation of the trip channel.

D. ASSESSMENT OF SAFETY CONSEQUENCES

The RPS and PCIS actuations occurred as expected upon loss of RPS power. The inadvertent actuation of the MSIV due to high steam

tunnel temperature, while conservative with respect to containment and Reactor Pressure Vessel (RPV) isolation, unnecessarily challenged the reactor safety systems. The closure of the MSIVs removed the main condenser as a heat sink and required that the safety/relief valves operate to relieve RPV pressure. The safety consequences of this event were minimal.

E. CORRECTIVE ACTIONS

1. Immediate Corrective Actions

a. An upgrade model of EPMA logic cards was installed on both Unit 1 RPS Motor Generator Sets.

E. CORRECTIVE ACTIONS (Continued)

b. The upper Main Steam Tunnel Switches were calibrated and found to be within the tolerance bands.

2. Long Term Corrective Actions

a. The old model EPMA logic cards for the Unit-1 alternate EPMAs will be replaced on line.

b. The old model Unit-2 EPMA logic cards will be replaced during the next Unit-2 outage of sufficient duration.

c. Training Information Form (TIF) 95-258 was submitted to ensure the electricians and quality control personnel are properly trained in soldering techniques.

d. Efforts are underway to address the steam tunnel temperature trip setpoint issue. The current setpoints give very little operational margin and challenge the operators to install jumpers and reset PCIS logic within a very short timeframe. This issue has been classified as an operator workaround.

F. PREVIOUS OCCURRENCES

LER Number Title

373/94-015-00 Unit - 1 Primary Containment Isolation and SCRAM Due to Switch Failure

373/92-016-00 Unplanned ESF Actuation During Reactor
Protection System (RPS) Bus Transfer Due to
Personnel Error

G. COMPONENT FAILURE DATA

1D Reactor Protection System (RPS) Electrical Power Monitoring
Assembly (EPMA)

ATTACHMENT TO 9510020073 PAGE 1 OF 1

Commonwealth Edison Company
LaSalle Generating Station
2601 North 21st Road
Marseilles, IL 61341-9757
Tel 815-357-6761

ComEd

September 15, 1995

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Licensee Event Report #95-014-00, Docket #050-373 is being submitted to your office in accordance with 10CFR50.73(a)(2)(iv).

Sincerely,

D. J. Ray Station Manager
LaSalle County Station

DJR/TAH/lja

Enclosure

cc: H. J. Miller, NRC Region III Administrator
P. G. Brochman, NRC Senior Resident Inspector
R. J. Zuffa, IDNS Resident Inspector
F. Niziolek, IDNS Senior Reactor Analyst
INPO - Records Center
D. L. Farrar, Nuclear Regulatory Services Manager

*** END OF DOCUMENT ***